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~~(S)~~ NATIONAL RECONNAISSANCE OFFICE
WASHINGTON, D.C.

THE NRO STAFF

12 November 1975

MEMORANDUM FOR MR. MYRON KRUEGER, NASA

SUBJECT: News Release on Laser Communications

Attached is a copy of page 36 of "Electronics" magazine dated 16 October 1975. I am quite concerned about the statements attributed to NASA officials. As you recall, we made a point of consolidating potential Air Force and National applications for your consideration, and encouraged NASA in the pursuit of the $CO_2$ laser communication program.

Request you investigate these statements. If they indeed derived from Air Force actions, I would appreciate any detail you can provide.

[redacted]

HAROLD P. WHEELER, JR.
Colonel, USAF

Attachment
Excerpt

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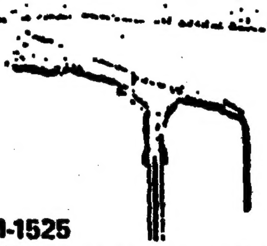

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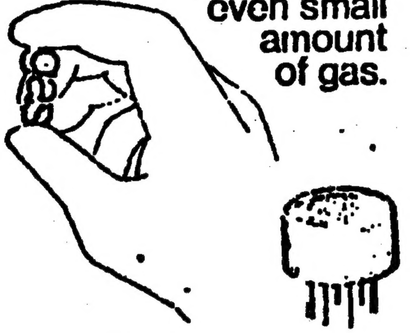

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the feeling among the defendants is that the suit will have little impact on the industry. □

### Cooperation upswing

After years of battling, semiconductor suppliers are cooperating. In the microprocessor area, Intersil Inc. and Harris Semiconductor will each supply three versions of Intersil's new 12-bit C-MOS microprocessor, the IM 6100, input/output and read-only memory chips, and 1-kilobit C-MOS random-access memories. Coming on the heels of National/Rockwell and Motorola/American Microsystems deals, the agreement, according to Intersil president Marshall Cox, enables a supplier to share the high development costs and have a line of second-sourced parts, an advantage in the market.

## Satellites

# NASA laser relay bows to Air Force

An unusual conjunction of military security, budget priorities, and advances in spaceborne laser technology has put the National Aeronautics and Space Administration out of the satellite communications relay business and left the Air Force in charge.

NASA's Goddard Space Flight Center is phasing out its five-year program to develop a spaceborne carbon monoxide laser communications system. Researchers there have been told that the $15–20 million needed to flight-test their space-to-space data relay will not be available in future fiscal years.

More than that, Goddard officials say the Air Force brought increasing pressure to stop the program because the NASA charter requires it to be unclassified. The systems approach of the NASA and USAF efforts "is very similar," one NASA official explains and "too much of it is being published" in open scientific literature. The Air Force is scheduled to [illegible] its own classified 405B advanced development program for satellite reconnaissance in 1979.

Compounding NASA's problem was that development of earth sensors and small, high-data-rate computers to be carried aboard advanced earth-observation satellites has not kept pace with NASA's development of a CO laser transceiver. NASA could not in the near future make use of the laser's 300-million-bit-per-second data rate.

**Military.** The Air Force 405B program, led by McDonnell Douglas Astronautics Co. East, is a 1-gigabit-per-second relay system aboard a much bigger satellite that also has room for a larger data processor and a laser of neodymium and yttrium aluminum garnet. The feasibility model of the Nd-YAG laser subsystem, developed by GTE-Sylvania Inc., Mountain View, Calif., operates at 500 million pulses per second. It is mode-locked and achieves its gigabit data rate by frequency doubling, say its developers.

With its high data rate, the Nd-YAG laser in the 405B program will be capable of relaying digitized TV signals in real time between satellites for retransmission to earth. Among other applications, the Air Force is anxious to monitor Soviet intercontinental missile sites with the system, to achieve a superior early warning capability. □

## Instrumentation

# IR sensor protects transfer standard

By comparing the heating effect of a signal and a known dc voltage, an ac-dc transfer standard measures true-rms voltages with a high degree of precision. But the circuitry that protects the device's thermoelement not only introduces errors, preventing correlation of the standard with National Bureau of Standards voltage cells, it also has to be switched in and out of the system for every measurement, preventing use of the